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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,903	02/28/2002	Richard J. Paolini JR.	H-316	9250
26245	7590	03/24/2004	EXAMINER	
DAVID J COLE E INK CORPORATION 733 CONCORD AVE CAMBRIDGE, MA 02138-1002				KOPEC, MARK T
		ART UNIT		PAPER NUMBER
		1751		

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/683,903	PAOLINI ET AL.	
	Examiner Mark Kopec	Art Unit 1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 1-14 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 15-29 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 28 February 2002 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

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This application claims benefit of 60/277,079 (filed 3/19/01) and 60/277,391 (filed 3/19/01). Claims 1-29 are currently pending.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-14, drawn to a two-phase electrophoretic medium, classified in class 252, subclass 570+.
- II. Claims 15-29, drawn to a process for producing a two-phase medium, classified in class 427, subclass 213.3.

The inventions are distinct, each from the other because of the following reasons:

Inventions of Group II and Group I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed may be made by a materially different process such as in-situ encapsulation or reverse-emulsion process.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter and their different

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classification, and because the searches required for these distinct groups are not coextensive, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. David Cole on 2/19/04 a provisional election was made with traverse to prosecute the invention of Group II, claims 15-29. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b)

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requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper."

Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the

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art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 15-29 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as

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obvious over Comiskey et al (6,120,839) or Albert et al (6,515,649).

Comiskey et al (6,120,839) discloses electrophoretic displays and materials useful in fabricating such displays. In particular, novel encapsulated displays are disclosed. Particles encapsulated therein are dispersed within a suspending, or electrophoretic, fluid. This fluid may be a mixture of two or more fluids or may be a single fluid. The displays may further comprise particles dispersed in a suspending fluid, wherein the particles contain a liquid (Abstract). A suspending (i.e., electrophoretic) fluid may be a high resistivity fluid. The suspending fluid may be a single fluid, or it may be a mixture of two or more fluids. The suspending fluid, whether a single fluid or a mixture of fluids, may have its density substantially matched to that of the particles within the capsule. The suspending fluid may be a halogenated hydrocarbon, such as tetrachloroethylene, for example. The halogenated hydrocarbon may also be a low molecular weight polymer. One such low molecular weight polymer is poly(chlorotrifluoroethylene). The degree of polymerization for this polymer may be from about 2 to about 10. Types of dyes for use in electrophoretic displays are commonly known in the art. They may be soluble in the suspending fluid. These dyes may

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further be part of a polymeric chain. Dyes may be polymerized by thermal, photochemical, and chemical diffusion processes. Single dyes or mixtures of dyes may also be used. Furthermore, capsules may be formed in, or later dispersed in, a binder.

Materials for use as binders include water-soluble polymers, water-dispersed polymers, oil-soluble polymers, thermoset polymers, thermoplastic polymers, and uv- or radiation-cured polymers (Col 4, lines 39-51). The porous internal phase of the capsule may include a cellulosic material, such as an alkylcellulose. Examples of alkylcelluloses include, but are not limited to, methylcellulose, methylhydroxyethylcellulose, hydroxyethylcellulose, hydroxypropylmethylcellulose, carboxymethylcellulose, and sodium carboxymethylcellulose. In another implementation, the microcapsule may have an internal surface structure, and the internal phase consists of two immiscible fluids with significantly different indices of refraction. The fluids can move under the influence of an applied Electric field, thus creating an electrically addressable optical surface. The result of fluid motion is either a large rough surface index mismatch, or a planar index mismatch at the center of the capsule. In short, any microencapsulated system wherein an internal liquid is migrated electroosmotically, and such electro-osmotic migration creates

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an optically different effect is contemplated (Col 10, lines 32-50). Typical manufacturing techniques for particles are drawn from the liquid toner and other arts and include ball milling, attrition, jet milling, etc. The process will be illustrated for the case of a pigmented polymeric particle. In such a case the pigment is compounded in the polymer, usually in some kind of high shear mechanism such as a screw extruder. The composite material is then (wet or dry) ground to a starting size of around 10 .mu.m. It is then dispersed in a carrier liquid, for example ISOPAR.RTM. (Exxon, Houston, Tex.), optionally with some charge control agent(s), and milled under high shear for several hours down to a final particle size and/or size distribution. Another manufacturing technique for particles drawn from the liquid toner field is to add the polymer, pigment, and suspending fluid to a media mill. The mill is started and simultaneously heated to temperature at which the polymer swells substantially with the solvent. This temperature is typically near 100.degree. C. In this state, the pigment is easily encapsulated into the swollen polymer. After a suitable time, typically a few hours, the mill is gradually cooled back to ambient temperature while stirring. The milling may be continued for some time to achieve a small enough particle size, typically a few microns in diameter. The charging agents may be

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added at this time. Optionally, more suspending fluid may be added. Chemical processes such as dispersion polymerization, mini- or micro-emulsion polymerization, suspension polymerization precipitation, phase separation, solvent evaporation, in situ polymerization, seeded emulsion polymerization, or any process which falls under the general category of microencapsulation may be used. A typical process of this type is a phase separation process wherein a dissolved polymeric material is precipitated out of solution onto a dispersed pigment surface through solvent dilution, evaporation, or a thermal change. Other processes include chemical means for staining polymeric latices, for example with metal oxides or dyes (Col 15, line 41 to Col 16, line 10). The encapsulation techniques disclosed at Col 19, lines 49-68 and Col 20, lines 22-25 and lines 55-65, appears to anticipate the above listed claims.

Albert et al (6,515,649) discloses electrophoretic displays and materials useful in fabricating such displays. In particular, novel encapsulated displays are disclosed. Particles encapsulated therein are dispersed within a suspending, or electrophoretic, fluid. This fluid may be a mixture of two or more fluids or may be a single fluid. The displays may further comprise particles dispersed in a suspending fluid, wherein the

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particles contain a liquid (Abstract). Materials for use in creating electrophoretic displays relate to the types of materials, including, but not limited to, particles, dyes, suspending fluids, and binders used in fabricating the displays. In one embodiment, types of particles that may be used to fabricate suspended particle displays include scattering pigments, absorbing pigments and luminescent particles. Such particles may also be transparent. Preferred particles include titania, which may be coated in one or two layers with a metal oxide, such as aluminum oxide or silicon oxide, for example. Such particles may also be retroreflective or have a reflective coating. Such particles may be constructed as corner cubes. Luminescent particles may include, for example, zinc sulfide particles. The zinc sulfide particles may also be encapsulated with an insulative coating to reduce electrical conduction. Light-blocking or absorbing particles may include, for example, dyes or pigments. A suspending (i.e., electrophoretic) fluid may be a high resistivity fluid. The suspending fluid may be a single fluid, or it may be a mixture of two or more fluids. The suspending fluid, whether a single fluid or a mixture of fluids, may have its density substantially matched to that of the particles within the capsule. The suspending fluid may be a halogenated hydrocarbon, such as tetrachloroethylene, for

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example. The halogenated hydrocarbon may also be a low molecular weight polymer. One such low molecular weight polymer is poly(chlorotrifluoroethylene). The degree of polymerization for this polymer may be from about 2 to about 10. Types of dyes for use in electrophoretic displays are commonly known in the art. They may be soluble in the suspending fluid. These dyes may further be part of a polymeric chain. Dyes may be polymerized by thermal, photochemical, and chemical diffusion processes. Single dyes or mixtures of dyes may also be used. Furthermore, capsules may be formed in, or later dispersed in, a binder. Materials for use as binders include water-soluble polymers, water-dispersed polymers, oil-soluble polymers, thermoset polymers, thermoplastic polymers, and uv- or radiation-cured polymers (Col 4, lines 33-58). The pigment-polymer composite may be formed by a physical process, (e.g., attrition or ball milling), a chemical process (e.g., microencapsulation or dispersion polymerization), or any other process known in the art of particle production. From the following non-limiting examples, it may be seen that the processes and materials for both the fabrication of particles and the charging thereof are generally derived from the art of liquid toner, or liquid immersion development. Thus any of the known processes from liquid development are particularly, but not exclusively,

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relevant (Col 15, lines 5-15). Chemical processes such as dispersion polymerization, mini- or micro-emulsion polymerization, suspension polymerization precipitation, phase separation, solvent evaporation, in situ polymerization, seeded emulsion polymerization, or any process which falls under the general category of microencapsulation may be used. A typical process of this type is a phase separation process wherein a dissolved polymeric material is precipitated out of solution onto a dispersed pigment surface through solvent dilution, evaporation, or a thermal change. Other processes include chemical means for staining polymeric latices, for example with metal oxides or dyes (Col 15, lines 55-66). The encapsulation techniques disclosed at Col 19, lines 36-68 and Col 20, lines 44-68, appears to anticipate the above listed claims.

The references are anticipatory.

In the event that any minor modifications are necessary to meet the claimed limitations, such as minor variation in percentages of continuous/discontinuous phases or selection of coating thickness, such modifications are well within the purview of the skilled artisan.

Claims 15-29 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Micale (4,891,245).

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Micale discloses process for producing particles for use in electrophoretic displays, wherein a heavy, solid pigment preferred for its high contrast or refractive index properties is coated with a polymer starting material. The process significantly reduces the specific density of the resultant particle, and creates particles with smooth polymer surfaces that can be chosen for stability in a given electrophoretic carrier fluid, and possess acceptable electrophoretic characteristics (Abstract). The invention relates to a process for producing particles of polymer encapsulated solid electrophoretic material, below 2 microns in size, wherein a polymer matrix completely surrounds an active ingredient and the resulting particles are configured to have a buoyancy which is effectively neutral with respect to an organic, electrically acceptable conductive carrier fluid (Col 1, lines 11-18). After an initial mixing step, the intermediate mixture is added to water in a concentration range of 1%-50% by weight, and then emulsified, with the preferable techniques being a high frequency blending by ultrasonic probe. The interfacial tension between the organic solvent and the water should be less than 10 dynes/cm, and preferably less than 5 dynes/cm. Depending upon the total system, the addition and dispersing step may require addition of a further surfactant, in the water phase, in order

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to reduce the interfacial tension to this level. As a matter of control, the average discontinuous liquid droplet phase in the emulsified dispersion should be less than 5 microns, and preferably less than 2 microns, and the emulsion should be stable for at least two hours after preparation. The solvent removal step is preferably by distillation, and may be accomplished by a roto-vapor, by direct evaporation to air, or any other equivalent means of solvent distillation extraction. If the mixing step has resulted in a sufficiently homogeneous mixture, and the addition and dispersing step has created an emulsion with a uniform discontinuous phase of droplets on the order of 1 or 2 microns, with the droplets containing substantially all of the primary particles, the danger of phase separation or flocculation of the discontinuous phase during solvent removal significantly is diminished. The solvent removal step leaves an aqueous suspension of solid submicron encapsulated particles with smooth surface morphology. The solid encapsulated particles then may be concentrated by evaporation of water, which may either be slow or fast in view of the inherent stability of the aqueous suspension fluid produced by the basic process (Col 3, line 61 to Col 4, line 26). The disclosed encapsulation techniques appear to anticipate the above listed claims.

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The references are anticipatory.

In the event that any minor modifications are necessary to meet the claimed limitations, such as minor variation in percentages of continuous/discontinuous phases or selection of coating thickness, such modifications are well within the purview of the skilled artisan.

In view of the foregoing, the above claims have failed to patentably distinguish over the applied art.

The remaining references listed on form 892 have been reviewed by the examiner and are considered to be cumulative to or less material than the prior art references relied upon in the rejection above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Kopec whose telephone number is (571) 272-1319. The examiner can normally be reached on Monday - Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on (571) 272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mak
Mark Kopec
Primary Examiner
Art Unit 1751

MK

March 22, 2004